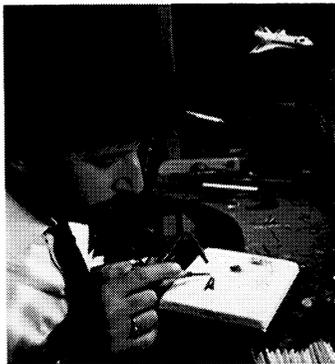


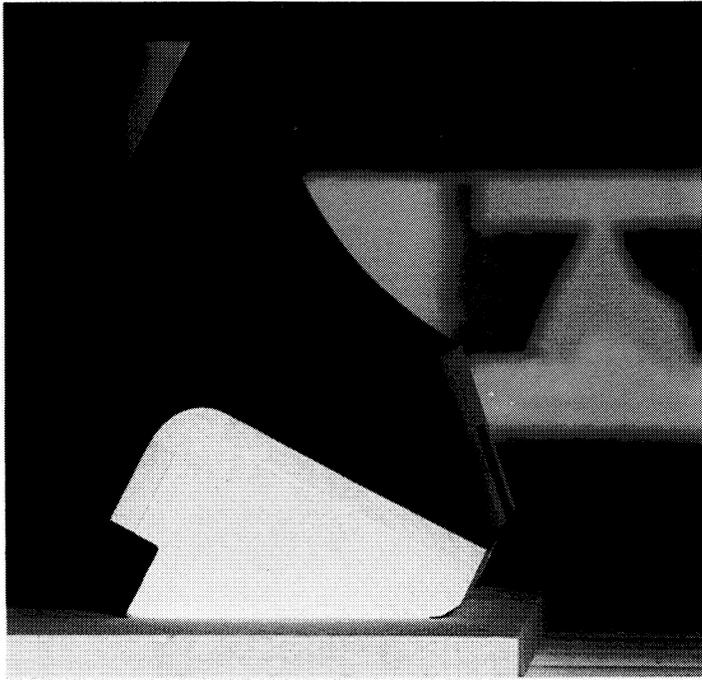
Jewelry Design



Above, Alan Kasson of Kasson Jewelers, Bridgeport, Connecticut is soldering a piece of gold jewelry. In the background is a model of the Space Shuttle Orbiter, a reminder to Kasson's customers that he is using a unique soldering base—a segment of an Orbiter heat shield tile.

Kasson's unusual application of Shuttle thermal protection technology was inspired by an article in *National Geographic* that described the tile shield that protects the Orbiter and its occupants from the searing heat of re-entry. Developed for NASA by Lockheed Missiles & Space Company, the tiles are made of silica fiber insulating material (see page 106) and they can withstand temperatures up to 2,300 degrees Fahrenheit





without melting. It takes some 34,000 tiles, each differently shaped to fit the Orbiter's complex contours, to protect the spacecraft's underbelly, nose and tail.

At left, a Lockheed technician is monitoring a numerically-controlled machine that is shaping an individual "T-bone" tile. After shaping, the tile's boron-coated outer surface must be cured in a kiln; the above photo shows one T-bone in the oven while another (foreground) has just emerged. At upper right are two cubes of tile material freshly removed from the oven; the glowing interiors remain hot but the darkened edges show that the surface has already cooled, illustrating the basic principle of Orbiter protection: the tiles cause heat on their surfaces to dissipate

rapidly while slowing heat transfer to their interiors.

The tile story sounded to Alan Kasson like the answer to a problem. A jewelry designer, repairman and stonemason, Kasson heats and solders precious metals with a jeweler's torch that generates temperatures of 1400-1800 degrees. He was using charcoal or asbestos blocks as soldering bases, but they were disintegrating at high temperatures. The Shuttle tiles offered a base with temperature resistance far beyond his requirements.

Kasson wrote NASA requesting a supply of tiles, stating the size he wanted and explaining how he intended to use them. NASA, which encourages secondary applications of aerospace technology, agreed to furnish the tiles at no cost in exchange for Kasson's pledge to report his experience with the tiles. Not long thereafter he received in the mail from Johnson Space Center four tiles, each six-

by-six-by-two inches, rejects designed for the Orbiter's fuselage but never used. Kasson cut them into smaller sizes to better fit his needs.

In the closeup below, Kasson is soldering a piece of gold jewelry; the torch has heated the gold to "yellow hot," but the photo shows no indication of heat transfer to other areas of the tile.

"The tiles are like firebricks," says Kasson, "but much softer, similar to styrofoam, while most fire-proof soldering material is very hard. The way in which I find the tiles most useful is to simply push the items to be soldered into the tile, which secures them in place while I solder." Also, the surface of the tile can be shaped and used as a mold for making *objets d'art*. Although the tiles crumble with wear, his technology utilization experiment has been successful, Kasson feels. ▲

